

C  
Ilbu L17  
1922

# ELECTRICAL SHOW

APRIL

20

21

22

MAT

APRIL

22



GYM ANNEX  
AND E.E. LABORATORY

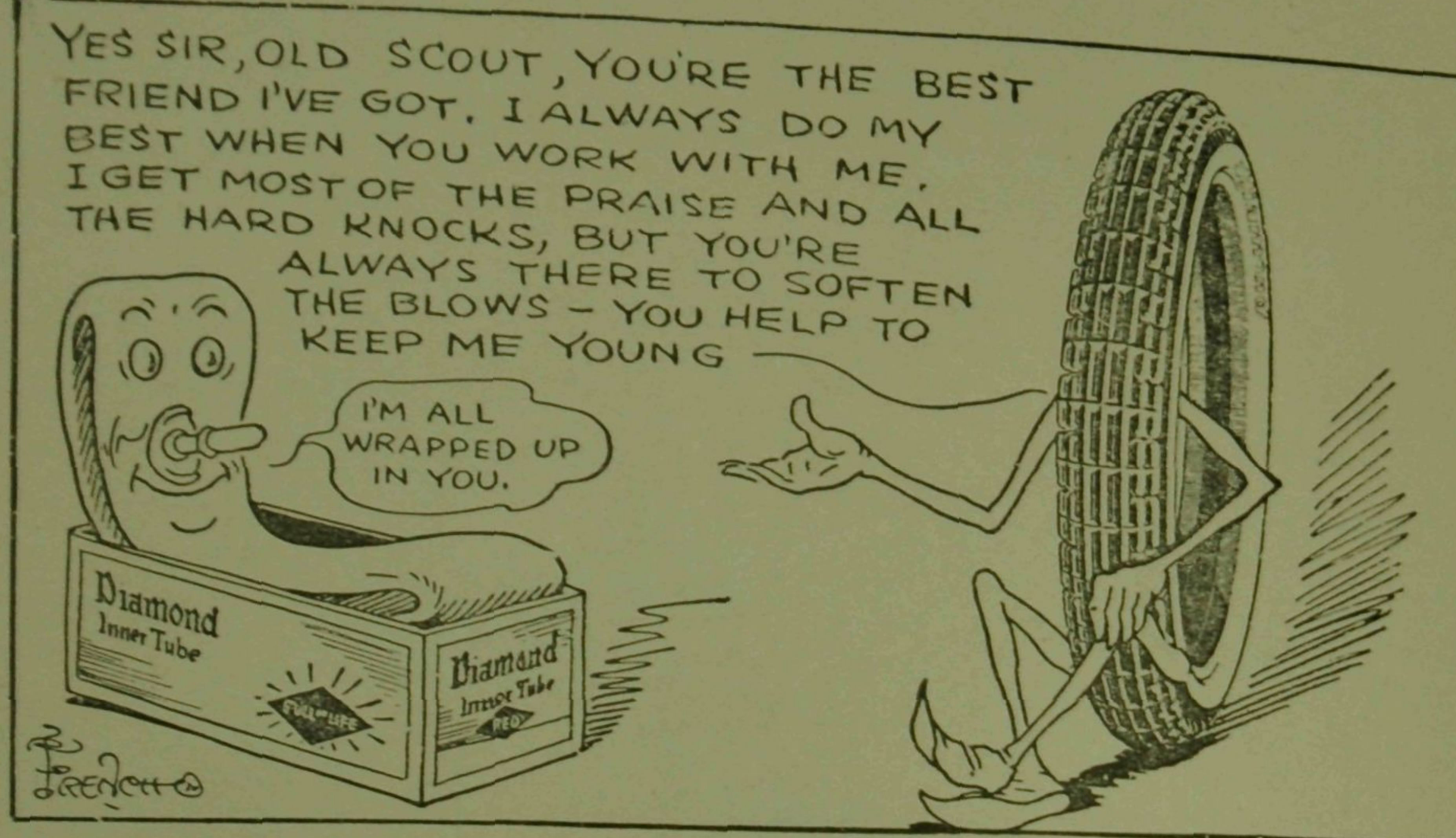
UNIVERSITY OF ILLINOIS

URBANA ~ CHAMPAIGN

NIGHT - 50¢

MAT - 35¢





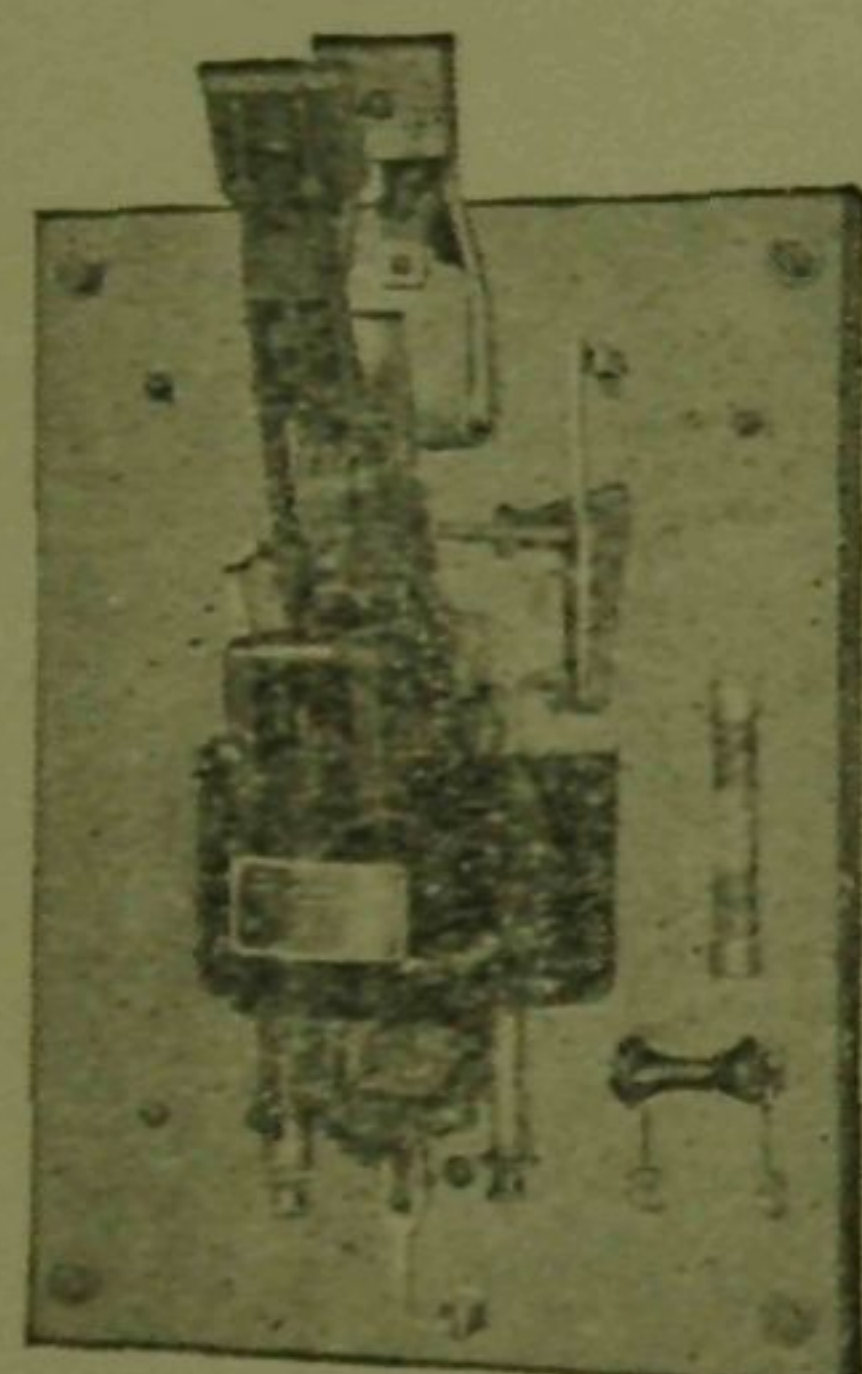
## WATSON-FAULKNER

L. W. Faulkner, Mgr.

Cor. Neil and Univ. Ave.

Champaign, Ill.

### *The Circuit Breaker with Brains*



DOES MORE THAN PROTECT  
IT OPERATES THE FEEDER  
THAT IT CONTROLS

IT NOT ONLY OPENS BUT IT ALSO  
AUTOMATICALLY RECLOSSES THE  
CIRCUIT IT PROTECTS WHEN,  
AND ONLY WHEN, LOAD AND  
LINE CONDITIONS ARE PROPER  
FOR IT TO RECLOSE.

LET'S GET ACQUAINTED

THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO.

COLUMBUS, OHIO

District Sales Offices in Principle Cities

Sales

Service

Cars **Ford** Trucks

*Fordson Tractors  
Lincoln Motor Cars*

E. V. KIRBY CO.

FLATIRON BLDG.  
URBANA

LINCOLN BLDG.  
CHAMPAIGN

*While your mind  
is on Electricity*

Remember that we have an adequate line of  
Students' Electric Study Lamps

And that we handle the Gill-  
Grindley Light Bulbs — the  
bulbs which give better light  
distribution.

S—S—S

"CHUCK" BAILEY

"SHELBY" HIMES



## A REVELATION IN FUSES



### CLEARSITE PLUG FUSES

Approved by Underwriters' Laboratories  
Often you have sought to determine which fuse in the cabinet has blown. In endeavoring to do so you had to try them all, because there was no way of distinguishing the fuse that had blown from those that had not.

With CLEARSITE FUSES there is no question—no uncertainty—no trouble or inconvenience. When a CLEARSITE FUSE blows a change takes place that makes it different from all others. A gap appears in the fusible section of the link, directly underneath the small, clear window, if the trouble is due to overload. If the fuse blows on a short circuit the window is blackened and vision of the link is made impossible.

THE ONLY PLUG FUSE USING THE FAMOUS ECONOMY "DROP OUT" LINK

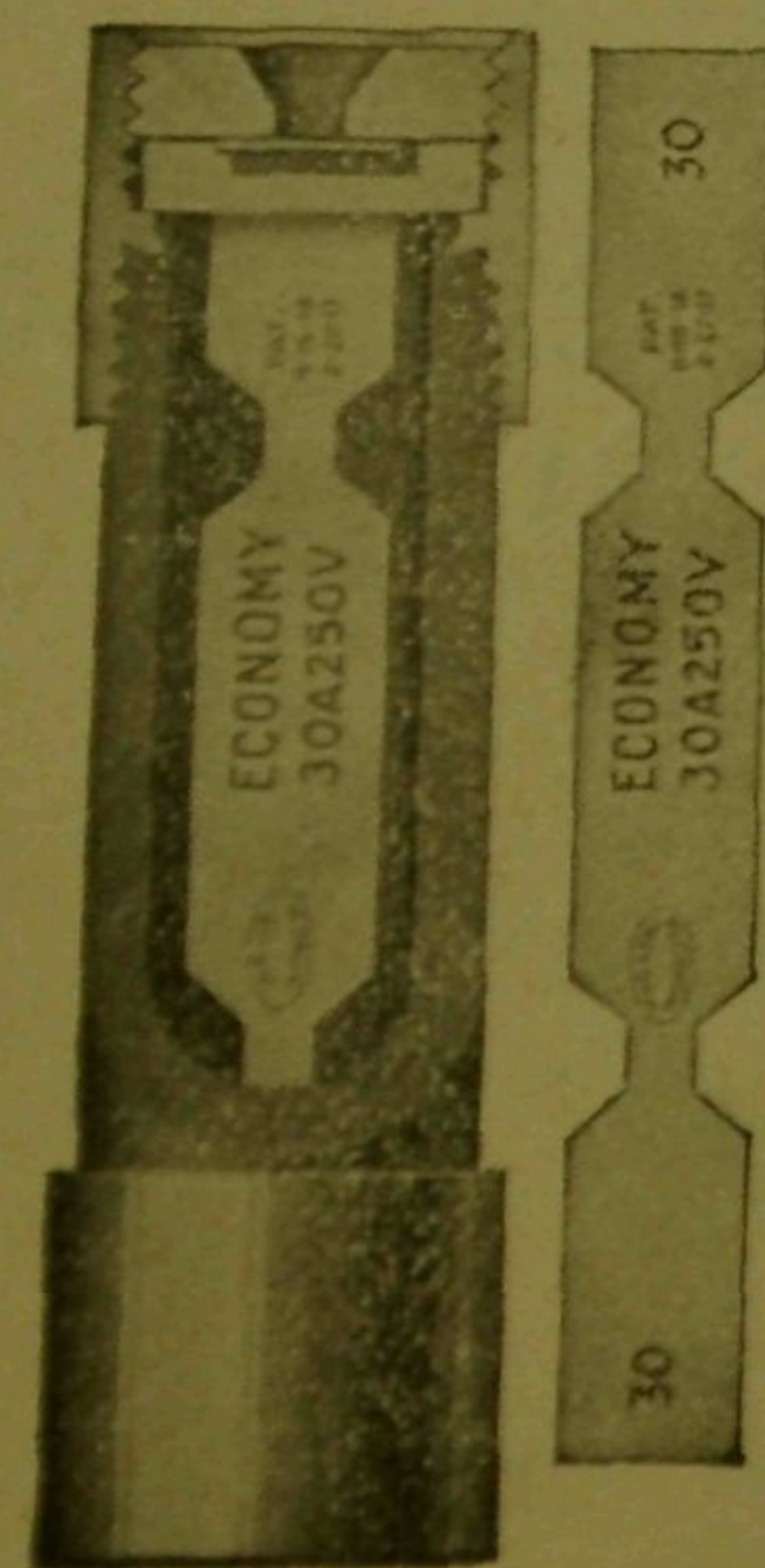


Packed in handy  
two-color packages

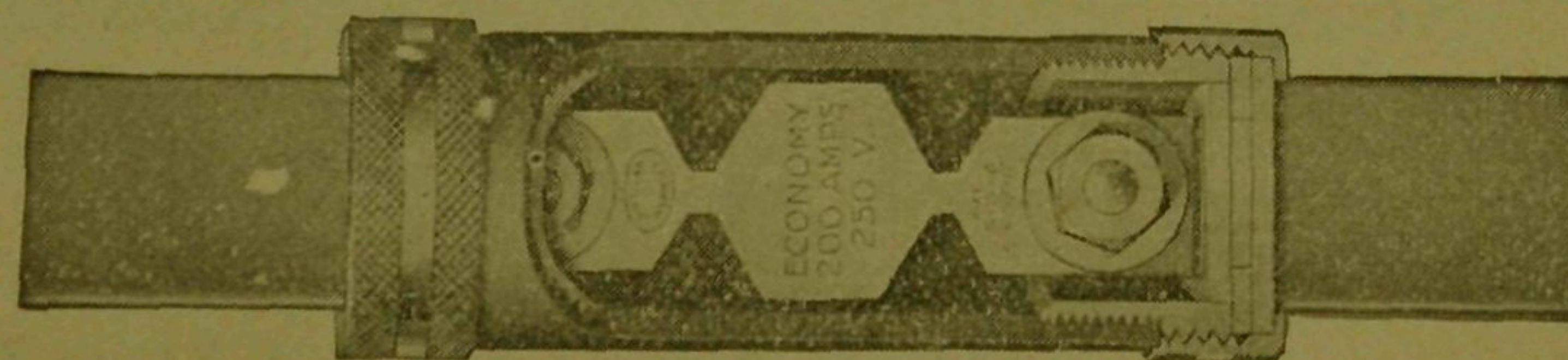
4 for 25c

### CLEARSITE FUSES EQUAL IN QUALITY

### Economy Renewable Fuses



Ferrule type with  
Economy "Drop-Out"  
Renewal Link



Knife-blade type with Economy "Drop-Out" Renewal Link  
You get the highest type of electrical protection when you install Economy Fuses in your circuits. And compared to the expense of "one time" fuses, maintenance costs may be cut 80 per cent,—for only the "Drop Out" Link is destroyed when the fuse blows.

Economy Fuses were the first fuses using an inexpensive bare renewal link to be APPROVED IN ALL CAPACITIES by the Underwriters' Laboratories.

Sold by all leading electrical jobbers and dealers

## Economy Fuse & Mfg. Co.

Greenview Avenue at Driversey Parkway

CHICAGO, U. S. A.

The Electrical Show given by the members of the Department of Electrical Engineering has become an institution at the University. It is a form of activity which seems to me advantageous for the students of the Department and for the rest of the University. It is educational as well as in some ways an amusement. It has been well managed in the past and in my opinion, is well worth repeating. Of course it is all the more helpful when the show is so arranged as to minimize mere stunts and rather to impress on the visitors some of the great principles and great achievements in electrical engineering.

DAVID KINLEY,  
President

### OUR GRATITUDE

The staff of the 1922 Electrical Show extends its sincere thanks to all those who have helped in any way to make this show a success. Especially to the Electrical Engineering Department for the use of apparatus. Also to the merchants, faculty and students who have made this show possible by their unsurpassable spirit of cooperation and aid they have given us; and finally to the merchants and manufacturers who have assisted both by loaning materials and by advertising.

### STAFF

C. L. CONRAD,  
General Manager



FIXTURES

SERVICE

# KRUSE ELECTRIC SHOP

"ANYTHING ELECTRICAL"

## The *Rotarex* Mangel

"THE LATEST THING FOR THE WIFE"

SEE IT WORK IN BOOTH

No. 24

111 S. FIRST STREET

M. 504

## ENGINEERED LIGHTING

Is Light Properly Controlled

### **X-Ray Lighting** from Concealed Sources

is the proper application of lamps and X-Ray Reflectors to secure a definite lighting result, such as Diffused Illumination, Color Lighting or special effects.

Campus installations of X-Ray Lighting:  
Smith Memorial Hall      Wesley Foundation  
Machine Shop              New Armory

Interesting literature and details furnished  
Gratis to Engineering Students

## National X-Ray Reflector Co.

235 West Jackson Blvd.

Chicago, Illinois

1922

## Electrical Engineering Show

University of Illinois

APRIL 20, 21, 22

E. E. Laboratory

Gym Annex

Under Management of the E. E. Society

### FACULTY OF THE ELECTRICAL ENGINEERING DEPARTMENT

Professor E. B. Paine, Head of the Department

Morgan Brooks	E. H. Waldo
A. R. Knight	E. A. Reid
P. H. Burkhart	H. A. Brown
G. S. Parker	C. A. Keener
T. M. Bell	C. S. Bullions
E. E. Perkins	E. P. Price
Head of the Laboratory Shops, W. S. Goodspeed	

### BOARD OF MANAGERS

C. L. Conrad	General Manager
E. G. Krause	Chief Engineer
J. L. Howie	Assistant
W. A. Mann	Assistant
W. J. Behrens	Supt. of Electricians
W. B. Dehr	Treasurer
J. D. Vallier	Purchasing Agent
E. W. Taylor	Advertising Manager
D. B. Collings	Assistant
L. R. Ludwig	Assistant
J. E. Aiken	Chief of Radio
J. E. Parks	Assistant
J. B. Holston	Assistant
C. N. Clark	Business Manager
R. H. Hornback	Assistant
M. S. Nordgren	Display Manager
J. C. Haller	Assistant
R. L. Pollard	Assistant

### UTILITY BOARD

L. D. Zeek, Chairman

C. C. Smith  
J. W. Marquardt

R. Guenther  
R. J. Crandall

### ANNOUNCEMENT

The management of the 1922 Electrical Engineering Show has arranged all exhibits so that no spectator will receive the slightest shock.



# NORTH SHORE LINE

*Best Route  
Between*

## Chicago and Milwaukee

LIMITED TRAINS LEAVE CHICAGO  
EVERY HOUR ON THE HOUR  
FROM 5:00 A. M. TO 12:00 MIDNIGHT

Dining Cars Attached to Trains  
Leaving Chicago at 7:15 A. M.  
12:00 Noon and 4:45 P. M.

BAGGAGE CHECKED TO ALL POINTS

## SPECIAL SERVICE

STUDENTS WILL FIND THE CHARTERED  
CAR SERVICE VERY ATTRACTIVE, OWING  
TO THE FACT THAT THE USE OF THE CARS  
ARE EXCLUSIVE, AND REPRESENTATIVES  
OF THE COMPANY WILL PERSONALLY CON-  
DUCT THE PARTY OVER ALL PARTS OF  
THE PROPERTY.

## Chicago, North Shore and Milwaukee Railroad

Chicago Passenger Station  
209 S. Wabash Ave.

## PROGRAM

### GYMNASIUM ANNEX

1. Monroe Calculating Machine Co. Booth 1  
Demonstrating the uses of a modern calculating machine.
2. Dictaphone Company Booth 1  
Dictaphone. Demonstrating the convenience and time saving  
of the electrically operated dictaphone.  
C. F. Cook, Distributor, Springfield, Ill.
3. A Modern Transmission Network Booth 2  
A complete model of the transmission and distribution system  
which supplies light and power to the entire Mississippi valley.  
Commonwealth Edison Co., Chicago, Ill.
4. The Latest in Electric Cleaners and Washing Machines Booth 3  
Federal Electric Co., Chicago, Ill.
5. Ring the Peg Booth 4a  
Here's your chance to try your skill. This peg possesses some  
remarkable qualities which make it almost unringable.  
J. J. Love, '22
- 5a Radio Exhibit Booth 4  
A display of radio apparatus. By the Co-Op.  
In charge of E. H. Cunningham.
6. Aqualite Solution Booth 22  
This solution possesses some strange characteristics.  
F. E. Null, '23
7. The Spinning Disc Booth 22  
This disc when once started spinning on the glass plate will  
continue to spin indefinitely. Another case of perpetual motion.  
F. E. Null, '23
8. Animated Cigarettes and Matches Booth 22  
These cigarettes and matches were received in the mail a few  
days ago. Can you account for their action? E. E. Puls, '22
9. Coney Island Junior Amusement Park  
(a) Model Roller Coaster  
(b) Minature Merry-go-Round  
(c) Ferris Wheel  
(d) Minature Tower  
(e) Flashing Sign  
(f) Fountain Centerpiece  
R. J. Crandall, '24, R. E. Mueller, '24
10. Sangamo Meter Exhibit Booth 35  
Electric meters showing a sectionalized meter and the method  
of meter assembly. This is delicate work as a meter is as accurate  
in its workings as a watch.  
Sangamo Meter Works, Springfield Ill.





QUALITY - SERVICE - VALUES

**W. Lewis & Co.**

CHAMPAIGN

WRITE THE HOME FOLKS ABOUT THE ELECTRICAL SHOW

**YOUR STORE**

HAS A COMPLETE LINE OF

**STATIONERY**

Crane's Linen Lawn

Eaton's Highland Linen

Crane's Kara Linen

We Sell to Everyone

**ENGINEERS' CO-OPERATIVE SOCIETY**

J R. LINDLEY, Manager

BONEYARD AND MATHEWS

URBANA, ILL.

11. **Universal Heating Appliances** Booth 23  
 Displaying a high grade line of electric toasters and percolaters.  
 Also the Thor Washing Machines and Hamilton Beach Sweeper.  
 McClellan & Langhoff, Urbana, Ill.
12. **Rotorex Washing Machines and Mangles** Booth 24  
 These machines have features which will be of interest to every  
 housewife. Kruse Electric Co., Champaign, Ill.
13. **Meter Exhibit** Booth 27  
 Various watthour meters are on display here. Have the oper-  
 ators show you how to read the meter.  
 L. J. Hogue, '22, R. P. Soughers, '25
14. **A Wireless Light** Booth 27  
 Here is an example of the wireless transmission of power.  
 S. M. Durst, '22
15. **Perpetual Motion—Problem of Ages Solved** Booth 27  
 The two things which tend to stop a pendulum, air resistance  
 and friction have at last been made to work together and perpetual  
 motion is the result. J. W. Marquardt, '23
16. **The Electric Shop** Booth 26, 25  
 A complete exhibit of "Thor" washers and ironers, "Lawn-Dry-  
 Ette" washers, "Premier" cleaners, "Bryan Marsh" National Mazda  
 lamps, table lamps, boudior lamps, lighting fixtures and radiophone  
 station and supplies. Ideal Electric Construction Co., Champaign
17. **Preparation of Food by Electrical Appliances** Booth 5  
 A light lunch will be served at a nominal charge, showing the  
 use of electrical appliances in the modern kitchen.  
 Womans Welfare Committee  
 Isabelle Nims, Chairman
18. **Electrical Aids for the Home** Booth 6  
 Demonstrations to show how easy it is to keep house when you  
 use a Hamilton-Beach Vacuum Sweeper and a Coffield Electric  
 Washer. H. C. White Electric Co., Champaign, Ill.
19. **Typical Lighting System for One Bay of a Machine Shop** Booth 7  
 Central Electric Co., Chicago, Ill.
20. **Electric Meters and Instrument Transformers** Booth 8  
 Alternating and direct current watthour meters and portable  
 standard for testing. Duncan Electric Mfg. Co., Lafayette, Ind.
21. **Reflectors for Show Case and Window Lighting** Booth 9  
 Making your displays more effective by proper illumination  
 using X-Ray reflectors. National X-Ray Reflector Co., Chicago
22. **Alternating and Direct Current Ball Bearing Motors** Booth 10  
 Sectionalized motors and compensators showing their construc-  
 tion. Fairbanks, Morse & Co., Chicago



# RAY L. BOWMAN Jewelry Company

Watches, Diamonds, Art Goods

Hamilton Building

Champaign, Illinois

MISS RAY L. BOWMAN, Manager

# Mead's

## Cafeteria

610 E. Green St.

The New Golf Clubs and Golf Supplies  
for 1922 are now in

Come in and let me help you  
Select your needs

# B. E. SPAULDING

Drugs and Toilet Articles

On Green Street

# Lillard Getman-Hughes

## Furniture Co.

*We furnish the home complete*

Cash or Credit

CHAMPAIGN

23. The Spinning Coins Booth 11  
A coin dropped on the surface of the mercury will spin indefinitely due to the action of a revolving magnetic field near by.  
In charge of D. O. Whelan, '23

24. Burglar Alarm Booth 11  
This model of a modern house has been equipped with an automatic burglar alarm system. Open the door and obtain results.  
R. C. Groeger, '22, A. D. Kerns, '22

25. The Automatic Dog Booth 11  
This dog will in response to a whistle come out of the kennel, blink his eyes, bark, wiggle his ears and go back in the kennel.  
A. W. Breyfogel, '22, R. F. Wharton, '22 W. J. Jewell, '24

26. Fixtures Booth 12  
Attractive chandeliers and a complete line of desk and table lamps are on display.  
The Faries Mfg. Co., Decatur, Il.

27. Automatic Block Signals Booths 13 and 14  
This exhibit is designed to show the fundamental types of signaling practice on American railroads.  
1. Safety and time saving protection for a long single track allowing trains to follow each other closely.  
2. Protection of double track according to standard practice for double track signalling.  
3. Protection of the short single track by signals operating on the usual scheme where two interlocking plants are close together.  
4. Modern devices designed to prevent the possibility of two trains getting onto the same section of track at the same time.  
5. The various special features of train control; ask the operator to demonstrate the points.

The eighty odd relays used in this system were very kindly loaned by the Automatic Electric Company of Chicago.

O. L. Dixon, '23, H. H. Smith, '24,  
N. E. Sowers, '24, C. T. Parker, '24  
L. Ludwig, '25

28. Motor Driven Household Appliances Booth 15  
The apparatus shown here demonstrates the many time and labor saving applications of the small motor.  
Chandler Electric Co., Urbana, Ill.

29. Hydro Electric Plant Booth 16  
This exhibit is a miniature of a hydro electric generating station and illustrates one form of water turbine used in some of the big water power plants.  
J. M. Agnew, '23, P. A. Vance, '23

30. Model High Tension Line Booth 16  
This model line shows a number of methods and some of the equipment used on high tension transmission lines throughout the country.  
W. J. Powell, '22



# *Strauch's*

For pictures of the Electrical Show Stunts

## Electrical Mdse.

Bryant Marsh Lamps  
Stereopticon       "  
Daylight           "  
Universal Curlers  
Toasters  
Grills  
Percolators  
Irons  
Waffle Irons  
Flashlights and  
Batteries  
Study Lamps  
Lamp Shades  
Cord, Sockets,  
Plugs, etc.

## Photo

Kodaks  
Films  
Albums  
Supplies  
A Good Finishing  
Service from our  
Own Shops

## Art and Gift

Pictures  
Framing  
Glass  
Pottery  
Silver  
Bronze and  
Sheffield Wares

# *Strauch Photo-Craft House*

*The Home of Good Kodak Finishing*

625 So. Wright Street

31. Storage Batteries for Automobiles Booth 30  
Batteries for starting and lighting of automobiles and electric vehicle batteries. Cain's Exide Battery Station, Champaign
32. The Way to Better Light Booth 29  
Illustrating the development of light from the candle to the present gas filled electric bulb.  
National Lamp Works of General Electric Co., Cleveland, Ohio.
33. Wire Exhibit Booth 36  
A complete exhibit of small sized wire of all types and sizes.  
Belden Enamelled Wire Co., Chicago
34. The Singing Arc Booth 28  
By varying the amount of capacitance in the circuit various musical notes are produced by this arc.  
W. E. Davis, '22, J. E. Parks, '22
35. The Everflowing Wine Bottle Booth 28  
In these days of prohibition this apparatus is attracting attention all over the country. Get-Rich-Quick-Wallingford isn't in it with this contraption.  
H. H. R. Carlson, '22, E. Bollenbach, '22
36. Optical Illusions Booth 28  
Now you see it and now you don't. A clever arrangement and control of lighting. Can you not believe your eyes? You cannot.
37. Correct Methods of Wiring Installation Booth 17  
Safety first. Have your wiring correctly installed if you want to prevent fires.  
Brotherhood of Electrical Workers, Champaign, Ill.
38. Chicago, Milwaukee & St. Paul Booth 18  
Exhibit illustrating the many advantages of the electrical operation of a transcontinental railway system. Pictures of mountain scenery on the electrified divisions, of the electric locomotives and of the substation equipment. Minature electric railway, by courtesy of the American Flyer Co., Chicago, representing the Milwaukee's through coast train, the "Olympian."
39. Motors and Transformers Booth 19  
Polyphase and single phase induction motors in operation.  
Wagner Electric Co., St. Louis, Mo.
40. High Voltage Insulators and Trolley Specialties Booth 20  
Up to date equipment for street railway and power companies.  
Ohio Brass Co., Mansfield, Ohio



## DEMONSTRATING THE BIG THREE

*Rotarex Washer*  
*Rotarex Double Roll Ironer*  
*Apex Suction Cleaner*

**Chandler Electric Shop**

107 W. Main

Urbana

## *Printers Ink—*

## Make Millions Think

When you think of Printing, think how well we can serve you

**GEO. D. LOUDEN**  
**PRINTING COMPANY**

PRINTING  
BINDING

MAIN 602  
Champaign, Illinois

OFFICE  
SUPPLIES

HOME COOKING

ATTRACTIVE SURROUNDINGS  
TABLE SERVICE

## GREEN TEA POT

GREEN STREET

Our seating capacity of 200 allows many of you  
to be our guests

## BIDWELL'S BETTER CANDIES

Wright Street

Next to Post Office

### 41. Telephone and Telegraph Exhibit

Booth 21

In this booth may be seen the following instruments which are connected with a similar set in the Electrical Engineering Laboratory.

- (a) Printing Telegraph
- (b) Recording Telegraph
- (c) Morse Telegraph
- (d) Manual Telephone
- (e) Automatic Telephone

J. L. Howie, '22, D. H. Mason, '22

E. E. Smith, '23, R. Guenther, '23

### 42. House Wiring Specialties

Booth 31

Some of the inside working parts of the electrical equipment which enter into the process of house wiring. Switches, receptacles, etc.

General Electric Co., Chicago

### 43. The Hoover Suction Sweeper and the

Booth 32

Gainaday Washing Machine

The Hoover is the leader in its field. "It beats as it sweeps as it cleans." The Gainaday can be depended upon. It is the modern washwoman.

Urbana & Champaign Rwy., Gas &  
Electric Co., Champaign

### 44. Operation of Radio Telephone Station

Booth 33

An identical outfit is in operation in the Electrical Laboratory, and Victrola music and conversation of the visitors may be transmitted between these stations.

### 45. Loud Speaking Horn

Booth 33

By means of this voice amplifier, the human voice may be amplified many times and in the largest types, the voice may be heard for miles.

J. B. Holston, '23

### 46. Radio Equipped Automobile

Booth 34

Used at Tuscola, Ill. It is possible to talk to and from a moving automobile.

### 47. Cootie Power Motor

An example of an inefficient motor.

### 48. Magnetic Personality

Step forward and have your personality determined. This determination is based on the character of Douglas Fairbanks who has been rated 100 per cent.

D. O. Whelan, '22, W. T. Moffett, '23

### 49. The Electric Fountain

Booth 33

As the stream of water is thrown in the air beams of varied light are thrown on it. The light is refracted by the water producing the impression of a shower of gems.

H. N. R. Carlson, '22, E. Bollenbach, '22



# World's Finest Electric Train

On exhibition on track  
for visitors to the Uni-  
versity of Illinois Elec-  
tric Show.

You are invited to see  
this train and all of its  
modern ideas.

## Illinois Traction System

(McKinley Lines)

## The Urbana Light, Heat & Power Company

(Illinois Traction System)

Furnishes the energy for Light,  
Heat and Power for Urbana  
and the adjacent territory

All kinds of useful electrical ap-  
pliances for the home

No. 118 East Main Street  
Urbana, Illinois

### 50. The Traveling Sign

The sign placed in front of the gymnasium annex is operated by the mechanism you see in this booth. The sign is the only one of this type south of Chicago and is patterned after the sign on the State Dearborn St. "L" station. It has been designed and built entirely by students.

H. W. Knight, '22, Wm. Mann, '23,  
R. J. Crandall, '24, C. T. Parker, '24  
R. B. Taylor, '25

### 51. Gymnasium Annex Substation

(a) The power for the gymnasium annex is controlled from the switchboard in the rear of the booth.

Information Bureau

(b) Don't leave the building with a question unanswered. The man in charge here don't know everything but he will answer all questions that he possibly can. This is an educational show and we want everyone to learn as much as possible.

### 52. Martin Rotary Converter

This machine is supplied from 220 volt three phase mains and furnishes direct current for the Gymnasium Annex. It has been loaned to the Electrical Engineering Society by the Northwestern Electric Company.

In charge of R. C. Groeger, '22

## RAILWAY DEPARTMENT

Exhibit Located on the University Spur at Burril Ave.

### 53. The Latest in Electric Trains

McKinley Lines

This train shows all the conveniences of the best electrical train in America. This train is 216 feet long, weighs 360,000 pounds and costs \$107,002. It is a heavy duty locomotive, coach, sleeper and parlor car. All standard M. C. B. (Master Car Builders) equipped. This locomotive was built in the Illinois Traction Shops at Decatur, Illinois. It has a draw bar pull of 30,000 pounds and is capable of drawing forty loaded cars on a level track.

### 54. University Test Car

This car is equipped with an automatic starting device and registering apparatus for measuring current, voltage, power, speed, unevenness of track and many other variables. This car is used for test runs by students and faculty in the Railway Electrical Dept.

M. S. Leeming, '22, R. J. Malcolmson, '22

### 55. Birney Safety Car

This car is the type used on the Short Line. Have the operator explain the automatic and safety features of this car.

I. M. Halperin, '22



## See Our Booths

You can see a special demonstration

"Thor" Washers and Ironers  
 "Laun-Dry-Ette" Washers  
 Premier Cleaners  
 Bryan Marsh National Mazda Lamps  
 Radiophone Station  
 Lighting Fixtures  
 Portables and Boudoir Lamps

### IDEAL ELECTRIC CONSTRUCTION CO.

Inc.

University and Walnut Sts.

John Hughes

E. M. Krabbe '14



A WELCOME  
 AWAITS YOU AT  
 BOOTH No. 12

**Original, Artistic**  
 Economical Fixture  
 Trimmings

**We Are**  
 Designers, Modelers, Spin-  
 ners, Turners and Makers of  
 Gas, Electric and Combina-  
 tion

**BRASS FITTINGS**  
 Spun and Stamped Brass  
 Goods. Automatic Brass  
 Turnings

Brass, Bronze and Alumi-  
 num Castings of All Kinds  
 and Parts for Fixture Manu-  
 facturers and Dealers  
 Catalog No. 26

**Adjustable Brackets**  
 Portables and Metal  
 Shades  
 Catalog No. 27





Verdelite Patented



Verdelite Patented

### FARIES MANUFACTURING CO.

Decatur, Illinois

U. S. A.

## ELECTRICAL ENGINEERING LABORATORY

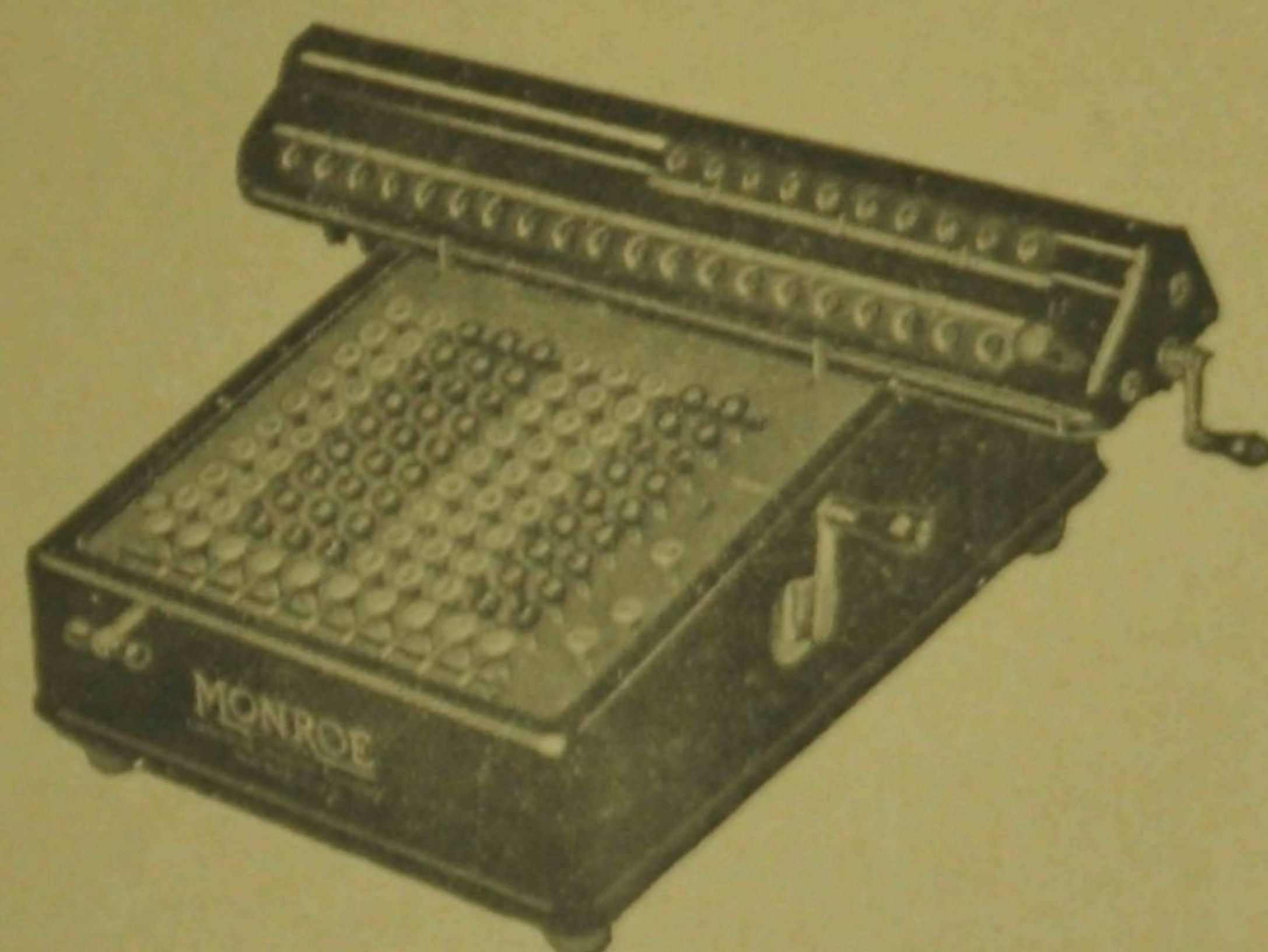
56. **The Static Machine**  
 The principle of static electricity and its relation to kinetic electricity. All kinds of harmless sparks and discharges.  
 C. E. Price, '25, H. A. Bartling, '25
57. **Minature Reproduction of Lightning Phenomenon**  
 Lightning striking a house. The spark is produced by the static machine. This display shows conclusively that lightning rods are a protection.  
 C. E. Price, '25, H. A. Bartling, '25
58. **A Modern Portable Motion Picture Machine**  
 This machine is the type now used in many class rooms, lecture halls and by many clubs. It requires little space and can be operated on the ordinary house lighting circuit.  
 F. W. Cox, '25
59. **An Automobile Ignition System**  
 This apparatus shows the essentials of an automobile ignition system and its operation. Step forward all ye auto owners and become acquainted with this portion of your machine.  
 Wm. Mann, '23
60. **Wireless Sparks**  
 Another electrical freak. How do you account for the spark between the two streams of water?  
 C. J. Robinson, '25
61. **A 5,000 Volt Direct Current Railway Motor**  
 This motor was built for experimental purposes and after it had served its purpose was donated to the University. It is used as a generator to supply high voltages for experimental work.
62. **Storage Battery Room**  
 These batteries are of 240 ampere-hour capacity and are used for experimental and research work in the laboratory.
64. **Mercury Arc Rectifier**
65. **Tungar Rectifier**
66. **Vibrating Type Rectifier**
67. **Cell Type Rectifier**
68. **Electric Furnace Room**  
 Notice the electric furnaces and the various pumps and pieces of apparatus used for experimental work.
69. **An Electric Welding Exhibit**  
 Here pieces of metal are electrically welded.
70. **High Tension Room**
  - (a) The transformer which supplies power to the Tesla Coil in the rear of the building.
  - (b) The alternator supplying power to the primary side of the transformer above.
  - (c) An old Edison Bi-polar machine. This machine is one of the first generators built in this country, but is now being used as a motor.



# Addition, Multiplication, Subtraction Division, Square Root

Every Operation is *Direct and Proved* on the

## MONROE



## CALCULATING MACHINE

The machine for ALL your figure work

### A FEW OF ITS MANY USES

Adding Debits  
and Credits  
Payrolls  
Estimates  
Costs  
Distributions  
Invoices  
Inventories  
Percentages  
Engineering Formulae  
Square and  
Cube Root

### A FEW OF ITS MANY USERS

American Tel. & Tel. Co.  
Bethlehem Steel Co.  
General Electric Co.  
Northern States Power Co.  
Pacific Light & Power Co.  
Pennsylvania System  
Price, Waterhouse & Co.  
So. Calif. Edison Co.  
Standard Oil Co.  
Stone & Webster  
U. S. Government  
West. Union Tel. Co.

The Monroe is so simple ANYONE can quickly learn its operation  
Be sure to stop at the Monroe Exhibit for a demonstration

## MONROE CALCULATING MACHINE CO.

General Offices: Woolworth Bldg., New York City  
Over 100 offices in U. S. and Canada render Monroe Service

### 71. The Art of Wire Communication

Exhibits showing the wire transmission of intelligence in all of its stages of development.

### 71a The Morkrum Printing Telegraph

Messages are received at this station from the similar station in the gymnasium annex. Messages may be sent from this station to the one in the gymnasium annex.

J. L. Howie, '22, D. H. Mason, '22 E. F. Smith, '23

### 72. The Morse Key and Sounder Telegraph

This telegraph outfit will send and receive messages from the gymnasium annex.

J. L. Howie, '22, D. H. Mason, '22 E. F. Smith, '23

### 73. The Morse Recording Telegraph

This device automatically records telegraph messages as they are received by the station.

J. L. Howie, '22, D. H. Mason, '22 E. F. Smith, '23

### 74. The Manual Telephone System

This system is employed extensively thruout the United States.

J. L. Howie, '22, D. H. Mason, '22 E. F. Smith, '23

### 75. The Automatic Telephone System

This system is becoming more popular today and shows the rapid stride in telephone engineering. The telephone girl is replaced by the numerous relays and special pieces of apparatus which give you the number dialed.

J. L. Howie, '22, D. H. Mason, '22 E. F. Smith, '23

### 76. An Exhibit of Telephone Parts

This exhibit shows the various portions of a telephone and also some of the earlier equipment used.

R. Guenther, '23

The above telephone and telegraph exhibits are made possible thru the courtesy of the Morkrum Company, the Western Electric Company, the Automatic Electric Company and the Signal Corps of the R. O. T. C.

### 77. The Voice of the Oscillagraph

By means of the device shown, the oscillagraph, different sound waves are thrown on the screen so that you can see them.

L. G. Abraham, '22

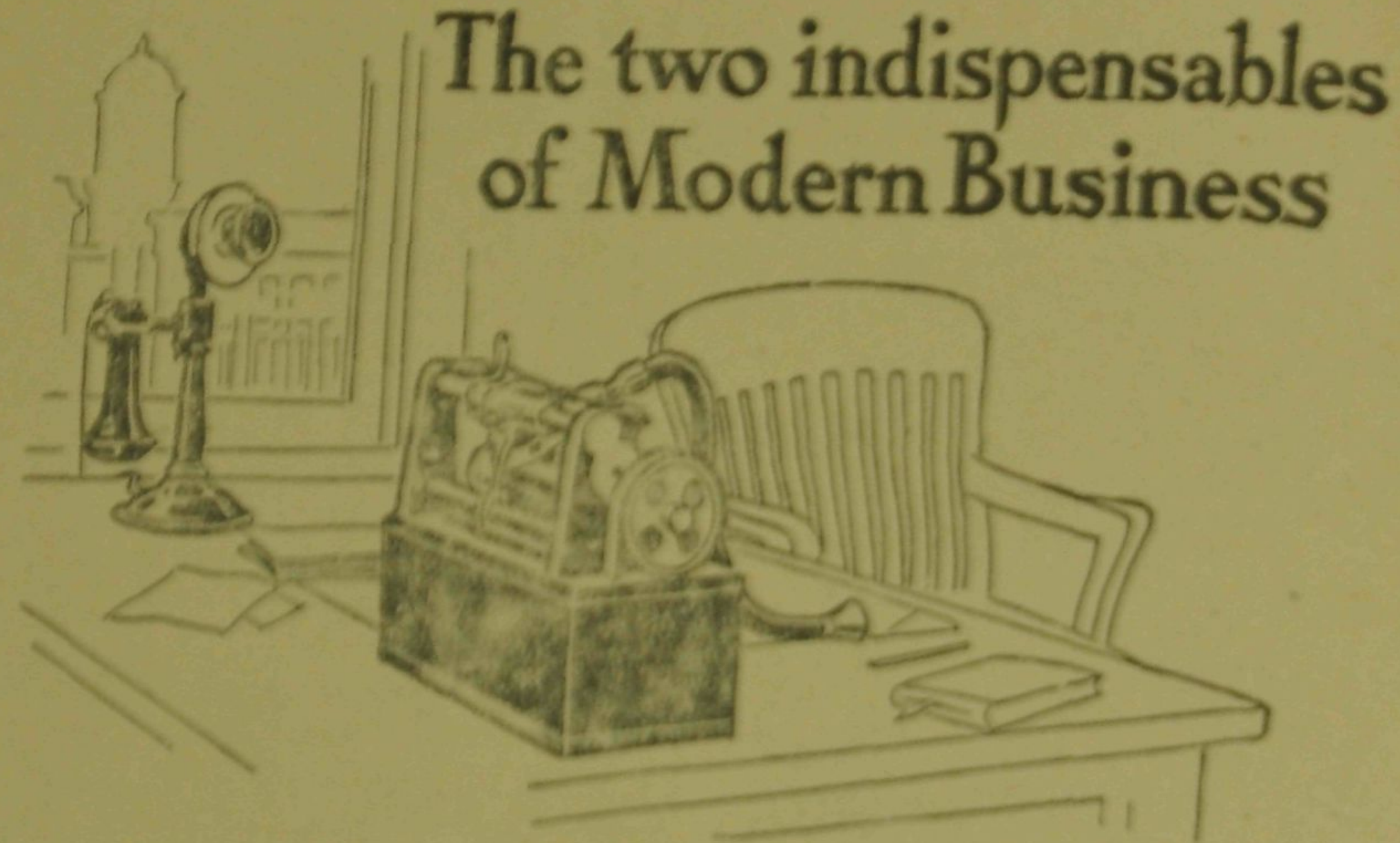
### 78. Tesla Coil Operation

The phenomenon of high frequency current was first discovered by Nicola Tesla about 1890. The apparatus used here is patterned after that used by him in his later experiments. A condenser discharging thru an inductance causes a high frequency current which induces a potential of about 1,500,000 volts in the long secondary coil. This, discharging between two terminals, produces the long spark which is the feature of the exhibit.

J. C. Howard, '22, J. C. Haller, '22 A. W. Edmunds, '24

H. Hayward, '24, J. H. Hazelhurst, '24





## The two indispensables of Modern Business

You use the **DICTAPHONE** just as you use the telephone.  
 Slip the receiver off the hook and TALK.  
 Both exist for the same purpose—to transmit messages. Both are instruments of  
 24 hour convenience. Talk to The **DICTAPHONE** at any hour of the day or night—your  
 stenographer will get your message.  
 See The **DICTAPHONE** in operation in Booth No. 1.

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 ON ALL MAKES

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Gar. 2262

### 79. Eugene Resonator

The operator in charge will take the high voltage from this coil thru his body and perform various stunts with it.

J. C. Howard, '22, J. C. Haller, '22

H. Hayward, '24, J. H. Hazelhurst, '24

A. W. Edmunds, '24

### 80. Museum

The striking feature of this exhibit is that less than 35 or 40 years ago all this apparatus was up-to-date. This shows the extremely rapid growth of electrical development. Many of these machines made in the laboratory by former students for special work

### 81. The Haunted Violin

This violin possesses some peculiar characteristics. Music is given off when the violin is held in certain positions. Wonderful isn't it?

A. A. Ralston, '22

### 82. Champaign County Radio Association Exhibit

An exhibit of the latest types of amateur receiving sets and radio telephone transmitters. An example of the best home made equipment used in the Twin Cities, and the latest apparatus that is on the market. This represents the better class of equipment that is being used in the two hundred radio stations in this community.

Information regarding the music broadcasting stations and the necessary equipment to receive them will be given upon request. If weather conditions permit, music from Pittsburg, Detroit and Chicago will be received.

### 83. Model of U. S. Naval Goniometric Station

In charge of J. E. Parks, '22

These small receiving stations are operated along the Atlantic coast by the United States Navy and are used to determine the location of ships at sea when requested. Two of these little stations determine the direction of the radio signals from the ship, and its exact position is plotted.

### 84. Operation of the University Spark Transmitter, 9XJ

This transmitter is automatically in this exhibit by an Omnigraph. Although this equipment is of odd design, its signals have been heard by amateurs from New Orleans to Minnesota and by ships at sea. It is to be partially replaced by the new broadcasting radiophone.

### 85. Exhibit of Radio Laboratory and Measuring Apparatus

This apparatus is used in the University Radio Laboratory in conjunction with the courses in radio engineering. The wavemeters, condensers, resistances, and vacuum tubes are used for various kinds of radio experiments and measurements.





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Lv. Clinton	1:50_p. m.	7:00_a. m.
Ar. Springfield	2:54_p. m.	8:30_a. m.
Ar. St. Louis	5:43_p. m.	12:40_p. m.

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# ILLINOIS CENTRAL

H. C. KNOPP, City Passenger and Ticket Agent  
Illinois Central Passenger Station, Champaign, Ill.  
Telephones, Main 143 and Garfield 1193

## 86. Water Model Showing how Radio Waves are Propagated

This water analogy illustrates how radio waves radiate out from a transmitter in the form of circular ripples of definite wave length.

## 87. Radio Telephone Station in Operation

This is a low power radiophone of the type used by U. S. Signal Corps for communication with airplanes. Another similar set is in operation at the Gym Annex and visitors may talk to the station there, and hear music transmitted from a victrola.

## 88. Exhibit of Army Radio Apparatus

The Signal Corps unit of the R. O. T. C. has loaned this equipment. These sets are used for field work and instruction in the regular courses in military training at Illinois, under the direction of Captain W. S. Rumbough.

## 89. Communication with a Walking Radio Telephone

In charge of J. W. Smith, '22

The apparatus here can talk to a man who carries a special portable radiophone on his person. Without any electrical connection between the two outfits, and walking entirely free, this man can talk back here to the visitors. Within a short time, we may hear our friends "talking through their hats."

## 90. Reproduction of Marconi's Successful Wireless Telegraph

The kind of apparatus used by the famous inventor who startled the world by transmitting intelligence without wires is shown in this exhibit. It may be contrasted with the modern apparatus and the radio telephone which have been developed in the last few years.

## 91. Broadcasting Radio Telephone

This transmitter has been recently designed and constructed in the electrical department at the University of Illinois. It has a power of 200 watts and its range will probably be from 500 to 1000 miles under good conditions. It will be used in broadcasting music and University news under a commercial license.

## 92. The Smallest Radio Receiver

With apparatus that may be held in the palm of the hand, messages and music may be heard from stations in the community, and with a large antenna stations several hundred miles away may be heard.

## 93. Automatic Record of Radio Messages on a Tape

With the use of the Hall Relay and Recorder, in conjunction with regular receiving apparatus, the messages actually being transmitted by the high powered stations on the Atlantic coast, engaged in trans-Atlantic communication are written down on a tape. The large antenna above the E. E. Laboratory is used to pick up the waves.



# NEW VARSITY THEATRE

53 MAIN STREET  
CHAMPAIGN

Ralph Benedict, (Ex '19) Lessee

A Few of our Coming Attractions:

April 25—Tom Mix in "THE NIGHT HORSEMAN"  
May 1—Antonio Moreno in "THREE SEVENS"  
May 6—Lionel Barrymore in "THE COPPERHEAD"  
May 9—Dustin Farnum in "THE PRIMAL LAW"  
May 20—Elliott Dexter in "THE WITCHING HOUR"  
June 27—Gaston Glass in "GOD'S CRUCIBLE"

Matinee Daily

E. E. SHOW IS NOW ON  
**Marshall's** *Spring Show of*  
**WOOLENS AND FURNISHINGS**

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Bradley Arcade

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GENTS FURNISHINGS  
CHENEY TIES A SPECIALTY

**Urbana Furnishing Store**

D. BECKER

126 W. Main St

Urbana, Ill.

## THANKS

We wish to take this means to express our appreciation of the following companies for loaning us equipment to use in this show:

Automatic Electric Co., Western Electric, Illinois Traction System, Delta Star Delta, Frank & Son, Stoolman, Morkrum, Northwestern Electric & Signal Corps.

STAFF.

### 94. Operating an Auto Horn by Radio Waves

By the use of a coherer, strong radio signals may be made to close a relay and operate any electrical device.

### 95. Message Forms and Blanks Used by Radio Operators on Passenger Ships

### 96. Exhibit of Radio Apparatus by the Co-Op Store

In charge of E. H. Cunningham, 9AP  
Amateur equipment and supplies, from the foremost manufacturers.

## PHYSICS DEPARTMENT

### 97. Vacuum Tubes

Every 30 minutes a tube will be exhausted by means of a mercury vapor pump. Notice the variation in discharge due to a decrease in pressure.

W. B. Worsham, '12, W. M. Young, '20

### 98. Properties of Cathode Rays

This exhibit shows the properties of the Cathode Ray.

W. B. Worsham, '12, W. M. Young, '20

### 99. The X Ray

Demonstration of the use of X rays for the detection of hidden objects.

W. B. Worsham, '12, W. M. Young, '20

### 100. Photo Electric Cells

Some experiments with photo electric cells showing how light may be transformed into electrical energy.

E. Atkison, '22

### 101. The Danish Wonder

With the plates on opposite sides of the stone and a difference of potential existing between the plates, force is required to separate them.

W. B. Worsham, '12, W. M. Young, '20

## DEPARTMENT OF CHEMISTRY

In charge of S. A. Silberman

### 102. Physical and Electrochemistry

Electrochemical phenomena. Spectra.

### 103. Industrial Chemistry

Use of the small electric furnace and temperature measuring apparatus, such as used in all commercial plants and laboratories.

### 104. Analytical Chemistry

Determination of copper by electrolysis. This method is extensively used on a large scale in commercial practice.



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# LeSeure Bros.

## Smokes

ON GREEN STREET, OF COURSE

## SHOES

# Snyder & Snyder

Bradley Arcade

312 Hickory

### 105. Organic Chemistry

Organic compounds that have been prepared by subsequent derivatives from a product of the electric furnace. These were all made possible by the great emergency that arose for the products on exhibition during the war.

### 106. Inorganic Chemistry

Fixation of Nitrogen by the Birkeland Hyde process. The Cyanamide Process of the fixation of Nitrogen. Starting with the raw material and following through to the possible hundreds of finished products of scientific and commercial value.

Application of some inorganic properties of the elements to our everyday use.

### 107. Fuel Division

Parr calorimeter. The importance of knowing the exact heat value of the fuel used in generating light and power.

### 108. Electroplating

Showing how various objects are given metallic coatings.  
R. C. Dhir, '22

### 109. Electrobleaching

This exhibit shows how bleaching may be accomplished electrolytically.

Burshan, '23

### 110. Piezo Crystals

Notice the effect of light on these crystals.

### 111. The Talking Skull

This peculiar skull was unearthed recently in a mound in the southern part of the state. Evidently the former character must have been some long winded fellow for he talks continually, although he is dead.

J. W. Hart, '25, J. H. Robison, '25

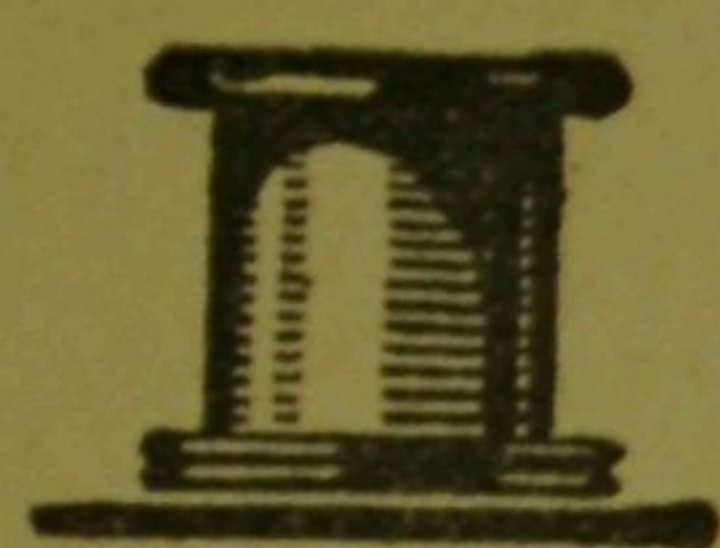
### 112. High Tension Transformer

This transformer will step up from 110 volts to 200,000 and is used to test insulation materials for breakdown. Note the precautions to protect the operator from this dangerous voltage.

### 113. 85 K. W. Motor Generator Set

This set consists of an alternating current motor driving a direct current generator, which supplies the laboratory with direct current.





# Belden



ELECTRICAL TAPE AND SLEEVING.  
RUBBER COVERED WIRE AND CABLE.  
BRAIDED AND STRANDED COPPER CABLE.  
TELEPHONE CORDS, WIRE AND SUPPLIES.  
TEXTILE AND BELDENAMEL MAGNET WIRE.  
WINDING MACHINES AND REVOLUTION COUNTERS.  
TIPS AND TERMINALS      MOLDED INSULATION  
ANNUNCIATOR WIRE      APPLIANCE CORDS  
ELECTRICAL COILS      WIRING ASSEMBLY

BELDEN PRODUCTS HAVE BEEN PREFERRED FOR MANY  
YEARS by the LEADING ELECTRICAL ENGINEERS of the Country

## BELDEN MANUFACTURING COMPANY

ELECTRICAL WIRE, CABLE AND CORDAGE

Twenty-third St. and Western Ave., Chicago  
Eastern Warehouse, Metuchen, N. J.

### 114. Main Switch Board

All electrical energy supplied to the laboratory from the power plant is controlled from this board. On it are mounted modern protective devices—circuit breakers—to prevent an excessive current from flowing, synchroscopes, ammeters, etc.

In charge of R. M. Kerchner, '22

### 115. Automatic Reclosing Circuit Breakers

These breakers open in cases of short circuit or excessive current flow and automatically close when the current reaches a normal value.

### 116. 45 K. W. Set

This outfit consists of an alternating current synchronous motor connected by belt to direct current generator. It is used for the purpose of supplying direct current for experimental purposes and has a capacity of 45 kilowatts. This set supplies energy to the 200,000 volt transformer.

### 117. Roth Set

This set is used for experimental purposes and is provided with ball bearings. It is possible by merely turning the hand wheel to obtain various power factors.

### 118. Magnet Display

An assortment of magnets. Notice the large magnet in the special frame.

### 119. Frying Eggs on Ice

This stunt shows the wonderful and mysterious powers of an invisible force. This is absolutely no fake. The ice is real and the griddle is hot.

H. E. Hahn, '23, T. W. Robinson, '23

### 120. The Principle of the Transformer

The development and theory of the transformer showing how current may be induced in a near-by coil without any electrical connection. In this manner alternating current can be changed from high to low voltage or vice versa. This method is used almost universally in transmission systems.

### 121. Tin Can Motor

Bring in your old tin cans and watch us make motors out of them. This is no fake. A rotating magnetic field makes the tin can turn. This is the same principle as the induction motor.

D. B. Collings, '22

### 122. The Poulsen Arc

This type of arc is used by naval stations for high power radio transmission. Notice the water cooled electrodes, gas container and the magnet coils all of which are special features of this type of arc. The arc operates on 500 volts.

S. M. Durst, '22

### 123. A ½ K. W. Synchronous Motor

This small motor is modeled after motors of a similar type used in large power stations and demonstrates the underlying principles of this type of motor. It has an amortisseur winding which makes it self starting.

S. M. Durst, '22

### 124. Speed Control

The Ward-Leonard System here shown is the most highly developed method of flexible and accurate control. This system is in use on American battleships. A three machine system so arranged that the motor can be run from zero to maximum speed.

### 125. Electric Cannon

There are wonderful possibilities for a gun of this type where no explosives are necessary. Closing a switch allows an electric current to flow through a coil. The induced magnetism hurtles the projectile from the gun.

E. L. Nelson, '22, C. N. Robinson, '22



# ILLINOIS LEADS

**I**LLINOIS is the center of the greatest electrical development on the American continent and leads in consumption of electricity per capita.

Illinois has more homes lighted by electricity than any other state in the union. One-quarter of the electric lighted homes of the nation are located in five middle western states, which includes Illinois.

Illinois is the center of the great Mississippi river Valley "Electrical Belt". The state has led in the development of high power transmission lines. Today 5,000 miles of transmission lines span the state from border to border like a gigantic web.

The development of these great transmission systems have guaranteed the people of the state better service than they could get from small isolated plants serving small communities. These transmission systems give electric light and power to small towns and farms which would otherwise be without this service. They make possible reduction in production costs, thus assuring lower rates than could be given by small plants.

Development of other utilities has also reached a high peak in Illinois, a total of \$1,350,000,000 being invested in the electric, gas, telephone and electric transportation services of the state. More than 500,000 thrifty inves-

tors of Illinois have invested their savings in the securities of these utilities.

The Commonwealth Edison Company is the largest steam generating electric central station company in the world. Its production in 1921 was 1,928,271,940 kilowatt hours, a record which is surpassed only by the great Niagara Falls hydro-electric power development. While the population of Chicago is 2.5 per cent of the total population of the United States, the Commonwealth Edison Company produces 4.7 per cent of the entire electric output of the public utility power plants (including electric railways) of the country.

Distribution of electricity from a central station in Chicago began in 1888. Since 1890 the city has increased in population two and one-half times, while the output of the Commonwealth Edison Company has increased 740 times.

The investment of the Commonwealth Edison Company in plants and equipment today is \$118,275,000 and this increases at the rate of about 10 per cent a year. It serves 540,000 customers and has about 6,000 employees. It is distinctively a home-owned institution, about 95 per cent of its 25,000 stockholders being residents of Illinois and 90 per cent of them living in Chicago. Approximately 40 per cent of its stockholders are women.

**Commonwealth Edison Company**  
Chicago, Illinois

## 126. Bucking Bronco

Here are some of the problems which the Electrical Engineer has to straighten out. Just when you think it is going ahead all right, it stops and starts back, only to reverse again. Illustrating the innate obstinacy of inanimate objects.

L. R. Ludwig, '25

## 127. Hand Power Generator

Turn the crank and have a practical demonstration of why electricity costs money.

## 128. Models of Old Motors

Showing some of the original types of motors.

## 129. The Human Welder

Watch the welding process conducted by a person who permits the current to pass through his body.

## 130. Automatic Elevator

This elevator is controlled automatically from the switch-board located on the lower portion of the shaft. Push the button corresponding to the floor to which you wish to go and it will go to that floor and be stopped by an automatic brake. This type of elevator is coming into practical use. The elevator in the Administration Building on our own campus is operated by this method.

W. Beck, '23

## 131. A Phase Advancer

This machine is designed to increase the power factor of a three phase wound rotor induction motor.

R. M. Kerchner, '22

## 132. Delta-Star Electric Company

13,000 Volt Single Phase Farm Power and Lighting Sub station.

Used to take power direct from the Hi-Line at a high voltage. A transformer is used in connection with this sub-station to reduce the voltage to 220-110 volts.

The unit is complete with disconnect switches, choke coil, lightning arrester, fuses and resistance grids.

H. K. Levy, '22, S. R. Negley, '22

## 133. Street Car Motor Control

This control system is used on local street cars.

## 134. Block Signals

By Illinois Traction System

The I. T. S. is protected by the type of signals shown in this exhibit. Everything operates automatically and trains are prevented from entering upon sections of track where there is either a broken rail or another train.



**135. Safety First Tower**

Electrical machinery is dangerous when improperly handled. Patrons of the Show are advised to follow the advice of the sign while visiting the show. When in doubt, take the safe course.

H. L. Hildebrand, '25, A. F. Henry, '25

**136. Recording Wattmeter**

This instrument is a new addition to the laboratory and records the amount of energy used during all hours of the day and night.

**137. Magnetic Blow-Out**

To extinguish arcs on street car controllers a magnetic field is used.

**138. Switchboard**

This switchboard controls the distribution of electricity to the South end of the laboratory. Note the regulator for keeping the voltage constant.

**139. Why Auto Wheels Turn Backward in the Movies**

Let the operator explain to you why it is that auto wheels seem to turn backward in the movies.

H. H. Zink, '23, M. W. Kenny, '23

**140. Parallel Operation of Generators**

The synchronous generators of two motor generator sets before you are both delivering power to the same load and have been so adjusted that they will divide any load proportional to their rating, though the machines are of different capacities.

**141. The Hair Raiser**

See how the hair stand on end. How many times have yours done likewise?

**142. Ladder Discharge and High Tension Exhibit**

The arc forming at the near portion of the opening, rises due to its own heat. Turn the controller and watch the sparks move.

E. P. Robertson, '23

**143. Inductor Alternator**

This machine was built by students in the department and is the only machine of its kind which we have. All of the parts which carry electric currents are stationary.

**144. Fool-proof Motor**

This motor is provided with a control panel with relays which absolutely prevent any harm being done to the motor no matter how inexperienced the man is who operates it.

In charge of W. Behrens, '22

**145. Instrument Exhibit**

The collection of instruments in this room is worth nearly \$5,000.00 and represents some of the best laboratory instruments on the market. Some of the instruments have been exploded to give an idea of the fine workmanship of these measuring instruments, almost every instrument is equipped with jeweled bearings.

**146. Synchronous Rotary Converter and Switch Board**

This machine will run one single, three or six phase and furnish direct current. It provides a means for many interesting experiments.

**147. Synchronization of Three Phase Alternators**

In order to connect alternating current generators in parallel they must first be in synchronism which consists of the same frequency, voltages equal and opposite in phase position. The rotating lamps indicate the proper moment for closing the switch.

**148. Wireless Typewriter**

Experiments have been carried on in our laboratory showing that it is possible to operate a typewriter by wireless. We were unable to borrow and could not afford to buy the necessary apparatus for this, so were forced to postpone this display.

**149. Loud Speaking Telephones**

Here you see the transmitting end of the loud speaking telephones. From this station are sent all messages which you can hear given out by the loud speakers at the Co-Op corner and in the gymnasium annex. This exhibit is possible thru the courtesy of the Western Electric Company.

In charge of J. C. Howard, '22.

**150. Delco Exhibit**

An exhibit of Delco Farm Lighting Equipment.  
O. Tinkey, Champaign, Ill.

**151. Frigid Air Machine**

An exhibit of a frigid air machine.  
O. Tinkey, Champaign, Ill.

**152. Alarm Systems**

Here we have a display of numerous forms of burglar, fire and traffic alarms. The sirens you hear about the campus have been kindly loaned us by the people who are putting on this exhibit.

Gamewell Fire Alarm Telegraph Co.





## A Gateway—Electrical

ONLY a forty-foot gateway bounded by two brick pilasters and ornamental lamps, but it is unlike any other gateway in the entire world.

For back of it is the General Electric Company's main office building, accommodating 2300 employees. And just next door is its main laboratory with the best equipment for testing, standardizing and research at the command of capable engineers. Then down the street a mile long—are other buildings where electrical products are made by the thousands of electrical workers who daily stream through

Through this gate messages and representatives from a score of other factories and over fifty branch offices come and go every hour—an endless chain of co-ordinated activities carrying on and enlarging the scope of over a quarter century's work for the betterment of mankind.

What a story this gate would tell, if it could, of the leaders of the electrical industry and of the ambassadors from other industries and institutions—and from foreign lands. The story would be the history of electric lighting, electric transportation, electrified industrials and electricity in the home.

**General Electric**  
General Office **Company** Schenectady, N. Y.  
95-450B

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Champaign, Illinois

This charming home like "Inn" holds a warm place in the hearts of the cultivated of the Twin Cities. One of those "wholly satisfying" places found once in a while and never forgotten. Concentrated comfort, perfect service and real hospitality. If we have never had the pleasure of serving you come in some noon or evening for luncheon. When the Easter Package bears our name, quality is assured.

No. 9 Main St.

Phone Main 946

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The healthiest and safest spot in the Twin Cities—  
60,000 cubic feet of fresh air circulated every minute

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AND MUSICAL PROGRAM AT  
PRICES WITHIN EVERYONE'S  
REACH.**

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Adults 25c plus war tax

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instrument. Thus any repairs which may be necessary in the years to come can be easily and economically made.

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Drawing Boards  
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are considered the best the world over

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